

FIG.1

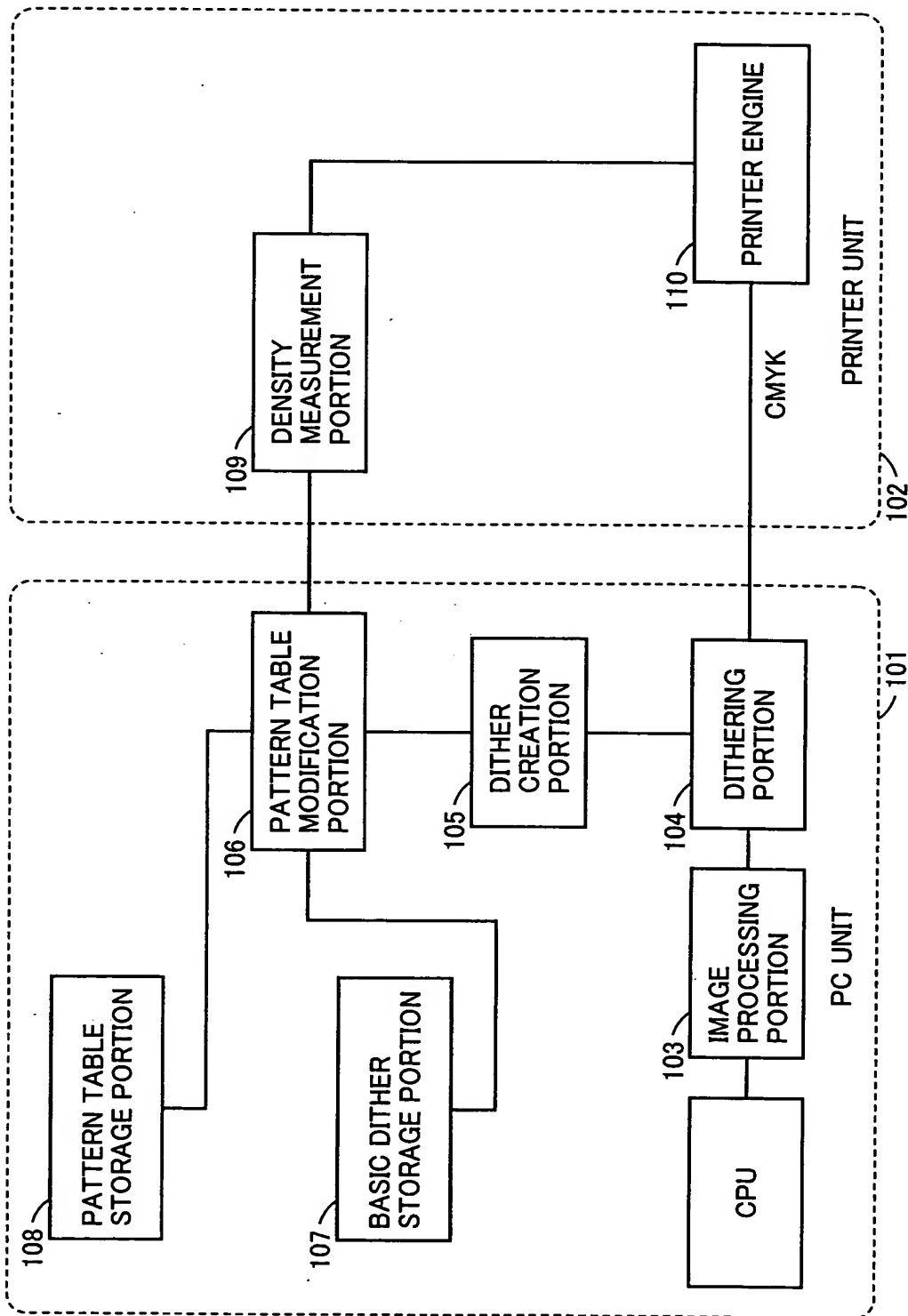


FIG.2

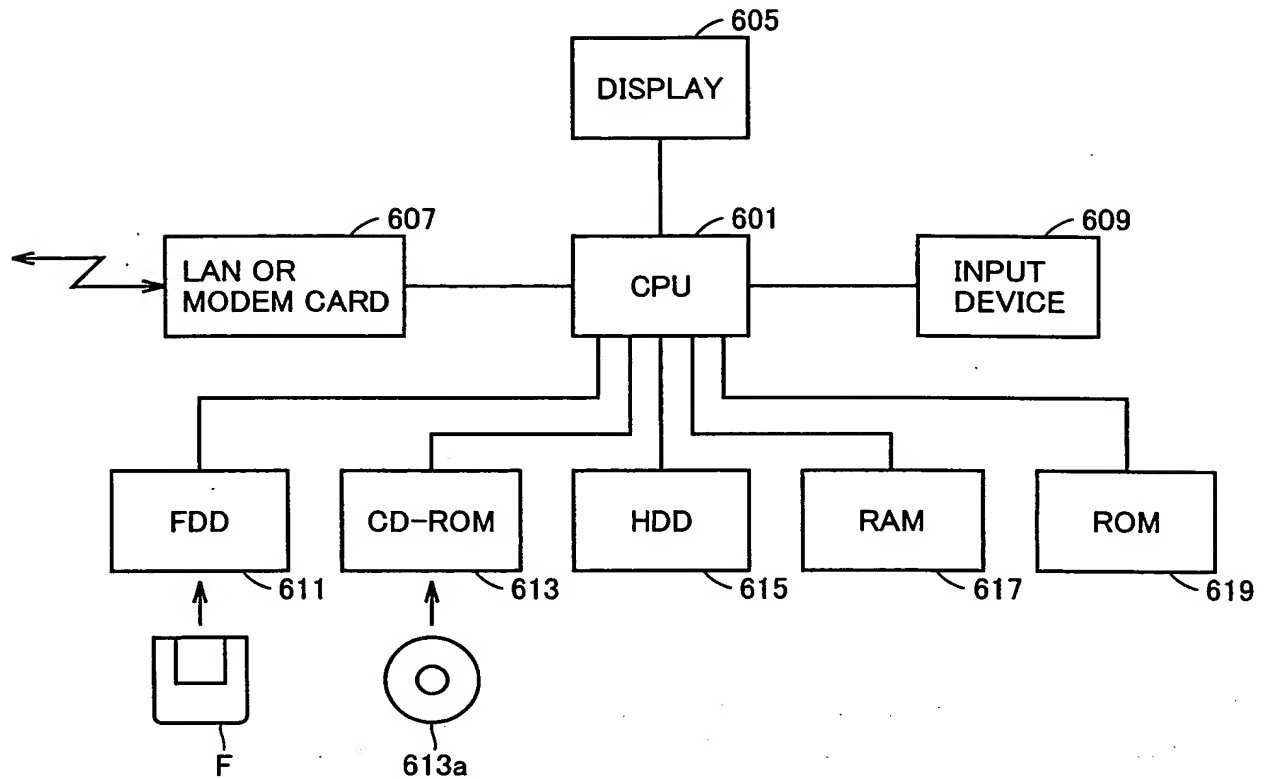


FIG.3

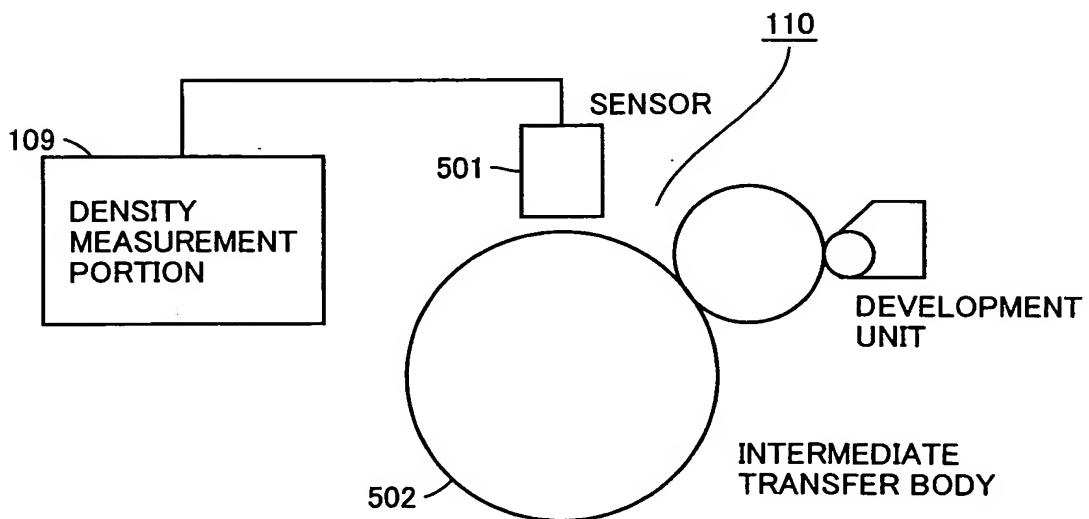


FIG.4

353 225 97 257 385 577 705 961 1057 929 673 545	385 237 109 289 397 589 717 973 1069 941 685 557	355 227 89 259 387 579 707 963 1059 931 675 547	367 239 111 271 399 591 719 975 1071 943 687 559
321 65 1 129 289 609 833 893 1121 1089 801 841	333 77 13 141 301 621 845 1005 1133 1101 813 653	323 67 3 131 291 611 835 995 1123 1091 803 643	335 79 15 143 303 623 847 1007 1135 1103 815 655
449 193 33 161 417 481 737 865 1025 897 769 513	461 205 45 173 429 493 749 877 1037 909 781 525	451 195 35 163 419 483 739 867 1027 899 771 515	463 207 47 175 431 495 751 879 1039 911 763 527
731 987 1083 955 689 571	369 241 113 273 401 593 721 977 1073 945 689 561	371 243 115 275 403 595 723 979 1075 947 691 563	379 251 123 283 411 603
659 1019 1147 1115 827 687	337 81 17 145 305 625 849 1009 1137 1105 817 657	339 83 19 147 307 627 851 1011 1139 1107 819 659	347 91 27 155 315 635
763 801 1051 923 765 539	465 209 49 177 433 497 753 881 1041 913 785 529	467 211 51 179 435 499 755 883 1043 915 787 531	475 219 59 187 443 507
361 233 105 265 393 585 713 969 1085 937 681 553	357 229 101 261 389 561 709 965 1061 933 677 549	363 235 107 267 395 567 715 971 1067 939 683 555	359 231 103 263 391 583 711 967 1063 935 679 551
329 73 9 137 297 617 841 1001 1129 1097 809 849	325 69 5 133 293 613 837 997 1125 1093 805 845	331 75 11 139 299 619 843 1003 1131 1099 811 851	327 71 7 135 295 615 839 999 1127 1095 807 647
457 201 41 169 425 489 745 873 1033 905 777 521	453 197 37 165 421 485 741 869 1029 901 773 517	459 203 43 171 427 481 747 875 1035 907 779 523	455 199 39 167 423 487 743 871 1031 903 775 519
727 983 1079 951 695 587	381 253 125 285 413 605 733 989 1085 957 701 573	383 255 127 287 415 607 735 981 1087 959 703 575	375 247 119 279 407 599
855 1015 1143 1111 823 683	349 83 28 157 317 637 861 1021 1149 1117 829 689	351 85 31 159 319 639 863 1023 1151 1119 831 671	343 87 23 151 311 631
759 867 1047 919 791 535	477 221 61 189 445 509 765 893 1053 925 797 541	479 223 63 191 447 511 767 895 1055 927 799 543	471 215 55 183 439 503

↓
(A)

↓
(A)

FIG.5

(A) ↑

(A) ↑

356 228 100 260 368 580 708 964 1060 632 676 548	368 240 112 272 400 592 720 976 1072 944 688 560	354 226 88 258 366 576 706 962 1058 930 674 546	366 238 110 270 398 590 718 974 1070 942 686 558
324 68 4 132 292 612 836 996 1124 1092 804 644	336 80 16 144 304 624 848 1008 1136 1104 816 656	322 66 2 130 290 610 834 984 1122 1090 802 642	334 76 14 142 302 622 846 1006 1134 1102 814 654
452 108 36 164 420 484 740 868 1028 900 772 516	464 208 48 176 432 496 752 880 1040 912 784 528	450 184 34 182 418 482 738 866 1026 898 770 514	462 206 46 174 430 494 750 878 1038 910 782 526
730 966 1082 854 688 570	372 244 116 276 404 596 724 980 1076 948 682 564	370 242 114 274 402 594 722 978 1074 946 680 562	378 250 122 282 410 602
658 1018 1146 1114 826 666	340 84 20 148 308 628 852 1012 1140 1108 820 660	338 82 18 146 306 626 850 1010 1138 1106 818 658	346 90 26 154 314 634
762 890 1050 922 784 538	468 212 52 180 436 500 756 884 1044 916 788 532	466 210 50 178 434 498 754 882 1042 914 786 530	474 218 58 186 442 506
364 236 108 268 366 566 716 972 1068 940 684 556	360 232 104 264 362 564 712 968 1064 936 680 552	362 234 106 266 364 566 714 970 1066 938 682 554	368 230 102 262 380 582 710 966 1062 934 678 550
332 76 12 140 300 620 844 1004 1132 1100 812 652	328 72 8 136 296 616 840 1000 1128 1096 808 648	330 74 10 138 298 618 842 1002 1130 1098 810 650	326 70 6 134 294 614 838 988 1126 1084 806 646
480 204 44 172 428 482 748 876 1036 908 780 524	456 200 40 168 424 488 744 872 1032 904 776 520	458 202 42 170 426 490 746 874 1034 906 778 522	454 198 38 166 422 486 742 870 1030 902 774 518
726 982 1078 950 694 666	384 256 128 288 416 606 736 982 1088 960 704 576	382 254 126 286 414 604 734 980 1086 958 702 574	374 246 118 278 406 598
854 1014 1142 1110 822 682	352 96 32 160 320 640 864 1024 1152 1120 832 672	350 94 30 158 318 638 862 1022 1150 1118 830 670	342 86 22 150 310 630
758 886 1046 918 780 534	480 224 64 192 448 512 768 896 1056 928 800 544	478 222 62 190 446 510 766 894 1054 926 798 542	470 214 54 182 438 502

FIG.6

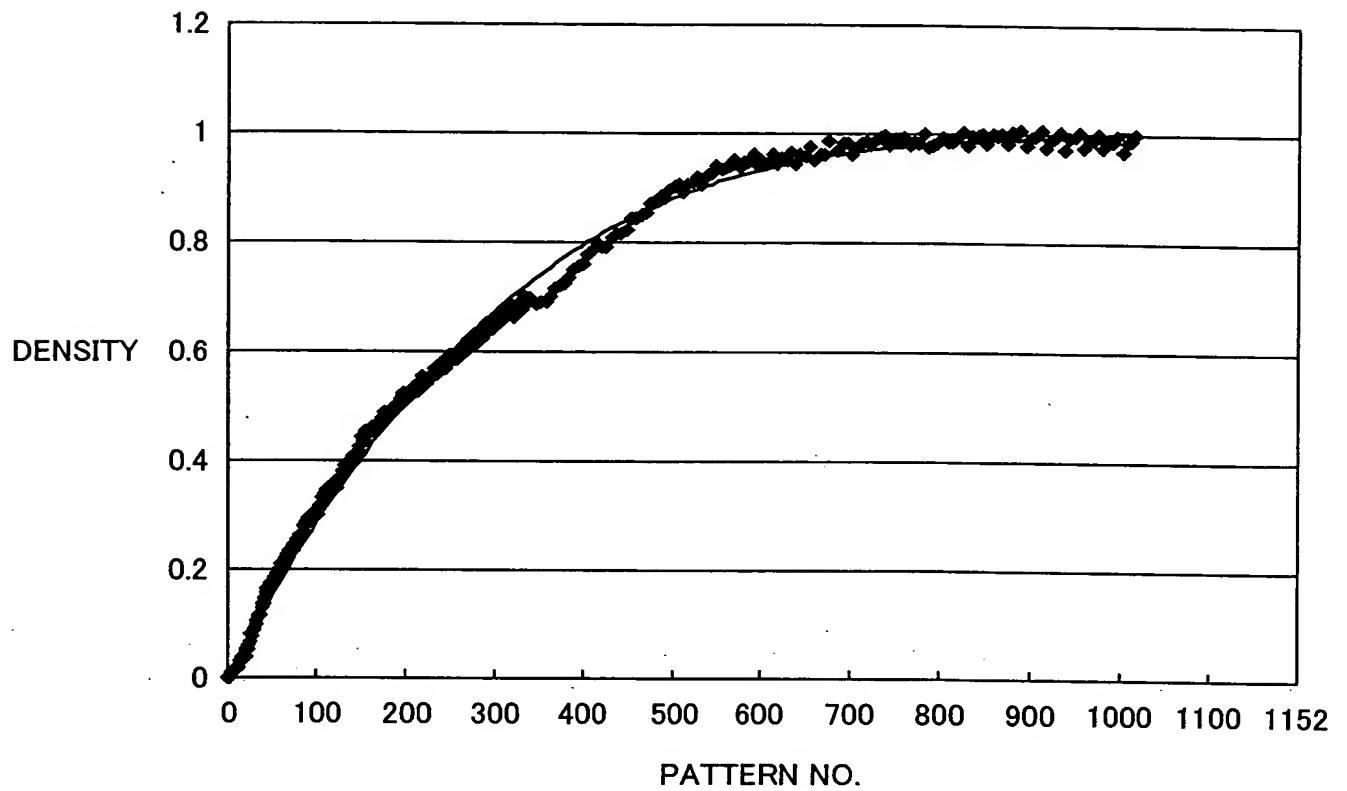


FIG.7

LEVEL	DITHER PATTERN THRESHOLD
1	0
2	2
3	15
4	25
5	30
6	32
7	35
8	37
9	39
10	40
11	41
12	42
13	43
14	44
15	45
16	46
17	47
18	48
19	49
20	50
21	51
22	52
23	53
24	54
25	55
26	56
27	57
28	59
29	61
30	63
31	65
32	67
33	69
34	71
35	73
36	75
37	77
38	79
39	81
40	83
41	85
42	87
43	89
44	92
45	94
46	96
47	99
48	101
49	103
50	106
51	108
52	111
53	113
54	116

55	118
56	121
57	123
58	126
59	128
60	131
61	133
62	136
63	139
64	141
65	144
66	147
67	149
68	152
69	155
70	158
71	160
72	163
73	166
74	169
75	171
76	174
77	177
78	180
79	183
80	186
81	189
82	192
83	195
84	197
85	200
86	203
87	206
88	209
89	212
90	215
91	218
92	222
93	225
94	228
95	231
96	234
97	237
98	240
99	243
100	247
101	250
102	253
103	256
104	259
105	263
106	266
107	269
108	272
109	276
110	279

FIG.8

111	282	167	484
112	286	168	488
113	289	169	492
114	292	170	496
115	296	171	500
116	299	172	504
117	302	173	508
118	306	174	512
119	309	175	516
120	313	176	519
121	316	177	523
122	319	178	527
123	323	179	531
124	326	180	535
125	330	181	539
126	333	182	543
127	337	183	547
128	340	184	551
129	344	185	555
130	347	186	559
131	351	187	563
132	354	188	567
133	358	189	571
134	362	190	575
135	365	191	579
136	369	192	583
137	372	193	587
138	376	194	591
139	379	195	595
140	383	196	599
141	387	197	603
142	390	198	607
143	394	199	611
144	398	200	615
145	401	201	619
146	405	202	624
147	409	203	628
148	412	204	632
149	416	205	636
150	420	206	640
151	424	207	644
152	427	208	648
153	431	209	652
154	435	210	656
155	439	211	660
156	442	212	664
157	446	213	669
158	450	214	673
159	454	215	677
160	458	216	681
161	461	217	685
162	465	218	689
163	469	219	693
164	473	220	697
165	477	221	702
166	481	222	706

FIG.9

223	710
224	714
225	718
226	722
227	726
228	731
229	735
230	739
231	743
232	747
233	751
234	756
235	760
236	764
237	768
238	772
239	776
240	781
241	785
242	789
243	793
244	797
245	801
246	806
247	810
248	814
249	818
250	822
251	827
252	850
253	900
254	1000
255	1100
256	1152

FIG.10

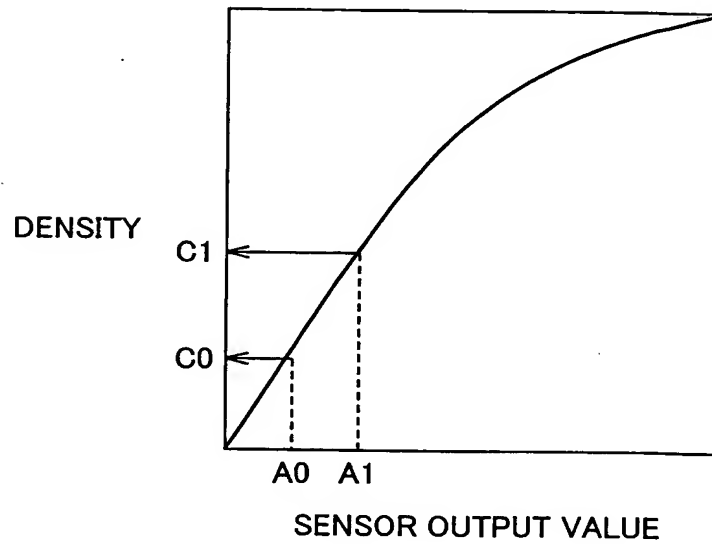


FIG.11

DENSITY DETECTION PATTERN

DENSITY DETECTION PATTERN	BASIC DITHER PATTERN
A	80
B	200
C	500
D	800
E	1153

FIG.12

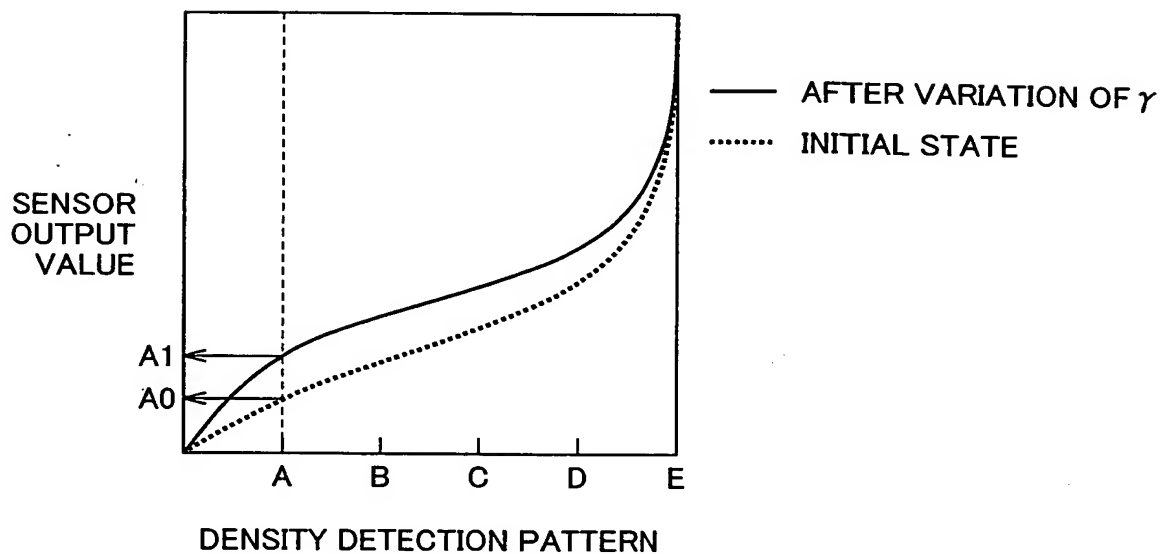


FIG.13

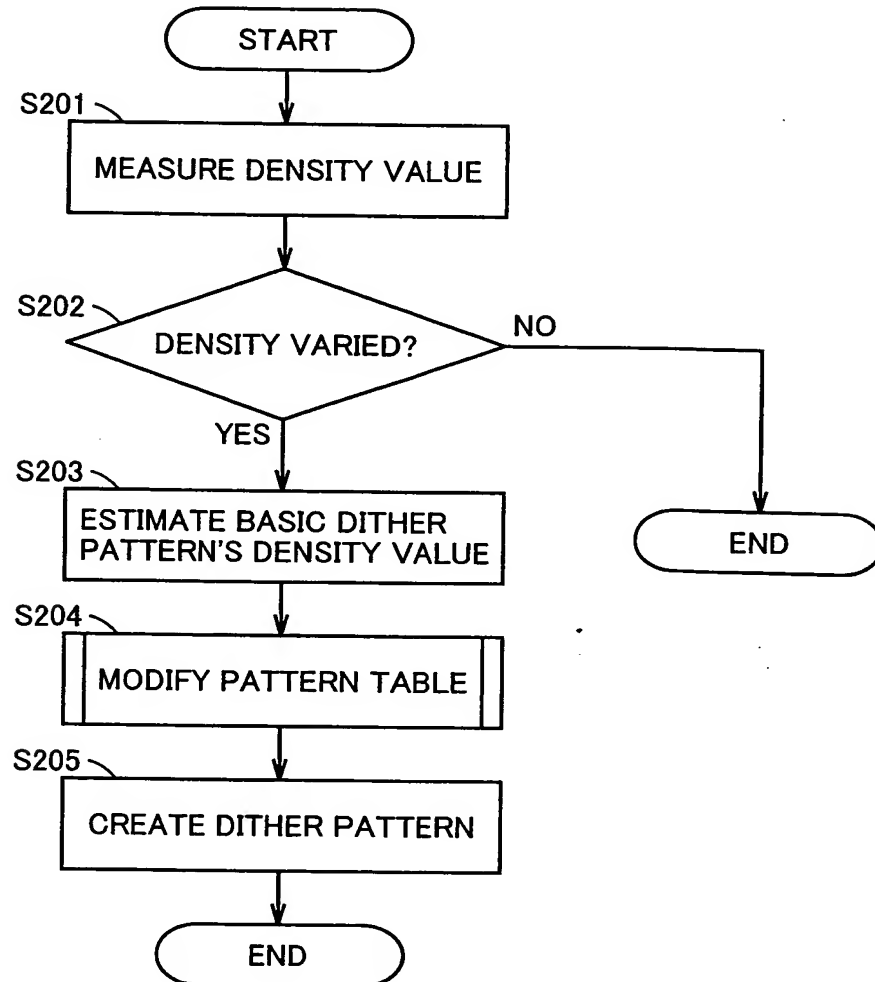


FIG.14

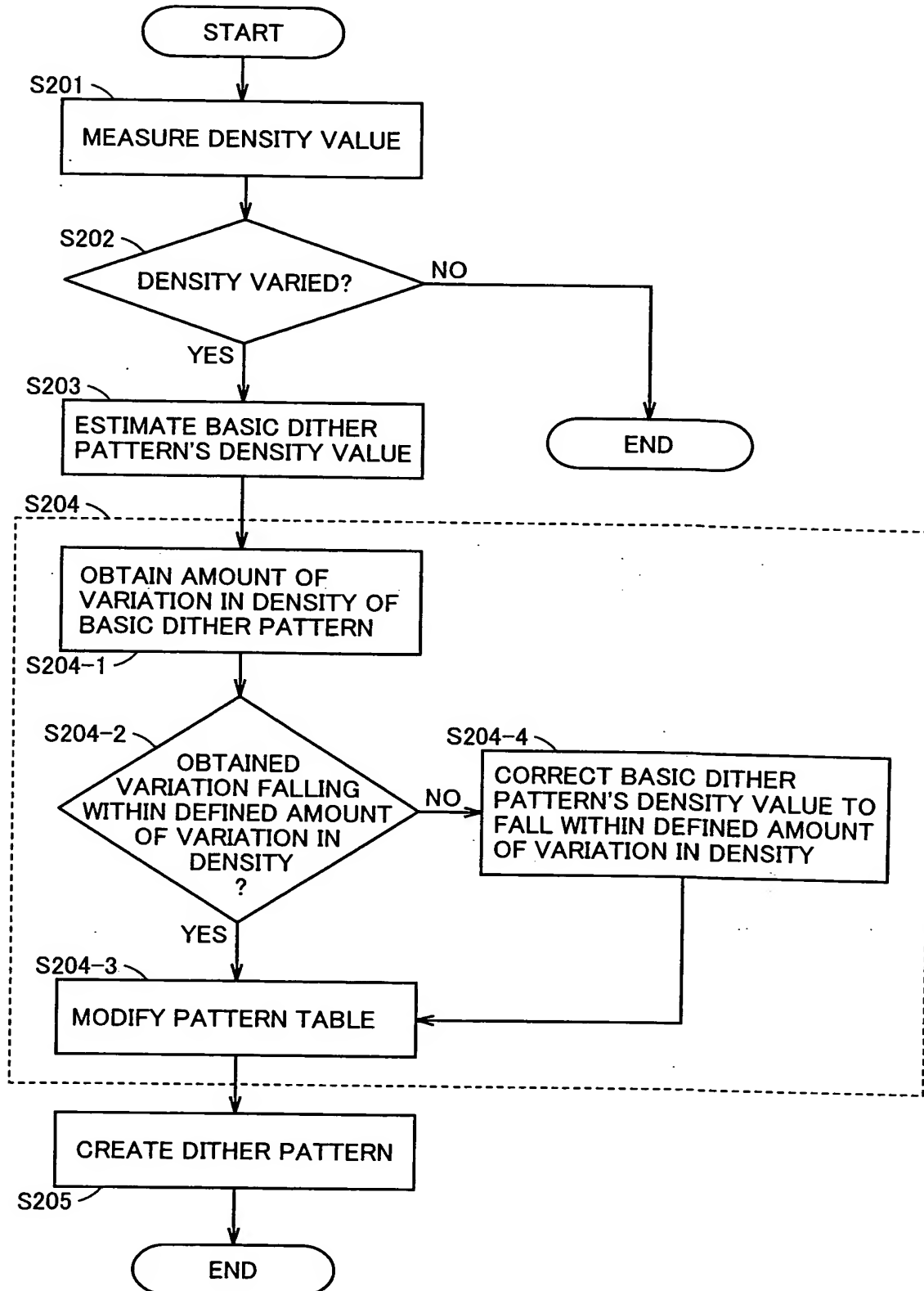


FIG.15

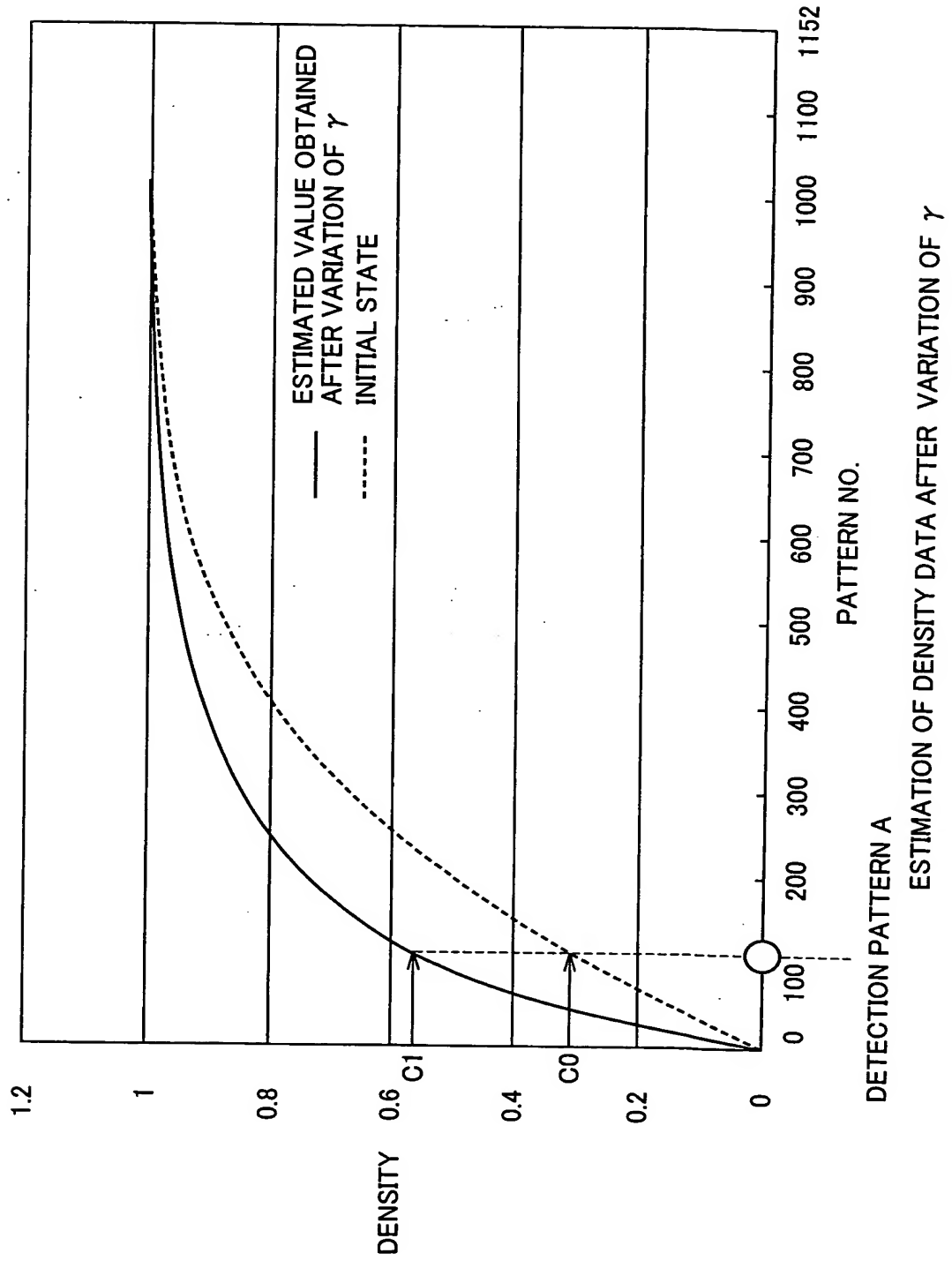


FIG.16

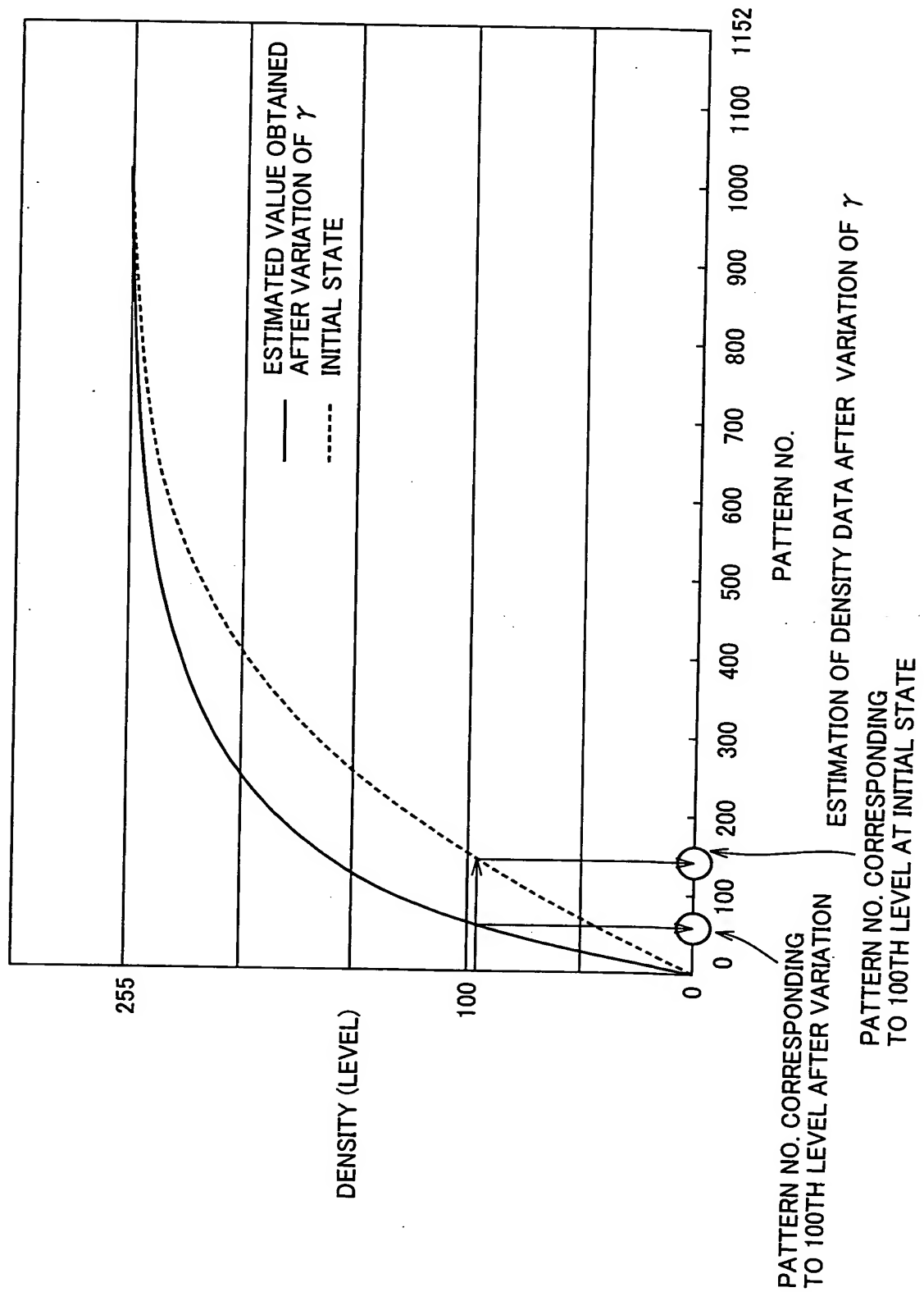
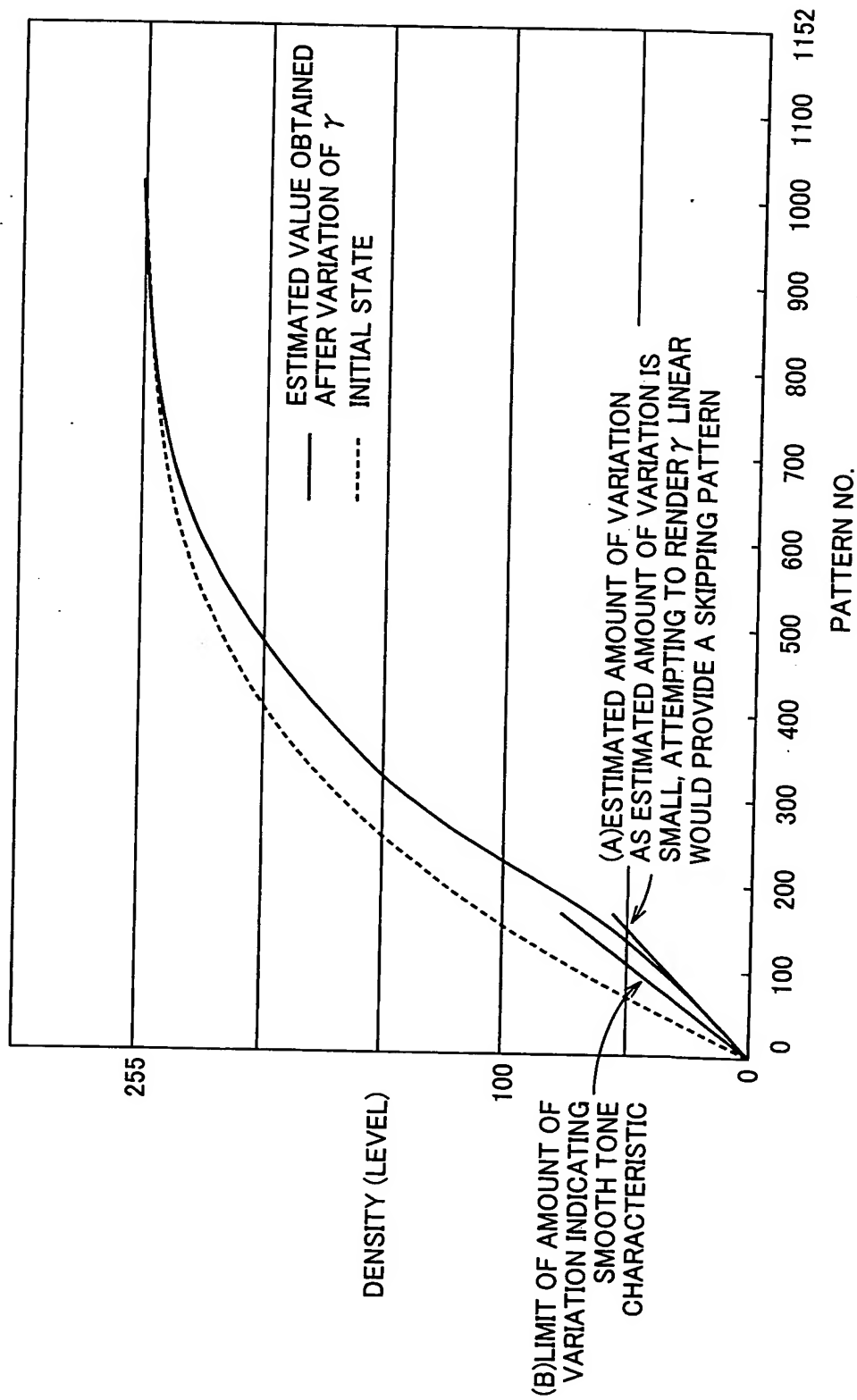


FIG.17



ESTIMATION OF DENSITY DATA AFTER VARIATION OF γ

FIG.18

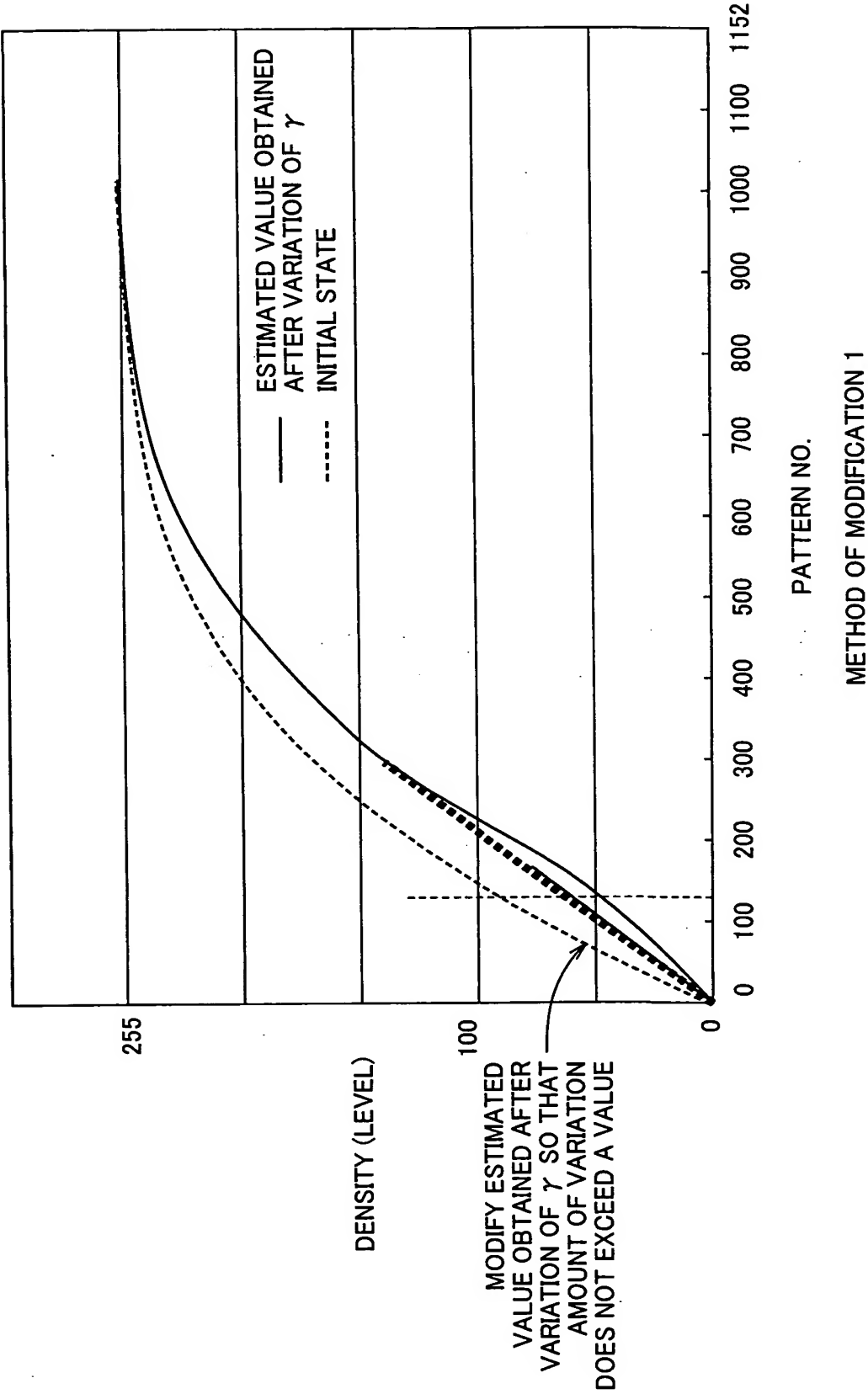


FIG.19

LEVEL	DITHER PATTERN THRESHOLD		LEVEL	DITHER PATTERN THRESHOLD
1	0		1	0
2	5		2	3
3	13		3	5
4	14		4	8
5	16		5	10
6	17		6	12
7	19		7	14
8	21		8	16
9	22		9	18
10	24		10	20
11	26		11	22
12	27		12	24
13	29		13	26
14	31		14	28
15	32		15	30
16	34		16	32
17	36		17	34
18	38		18	36
19	40		19	38
20	41		20	40

DENSITY RAPIDLY VARIES
 AS PATTERN VARIES

AFTER MODIFICATION

MODIFIED PATTERN TABLE

FIG.20

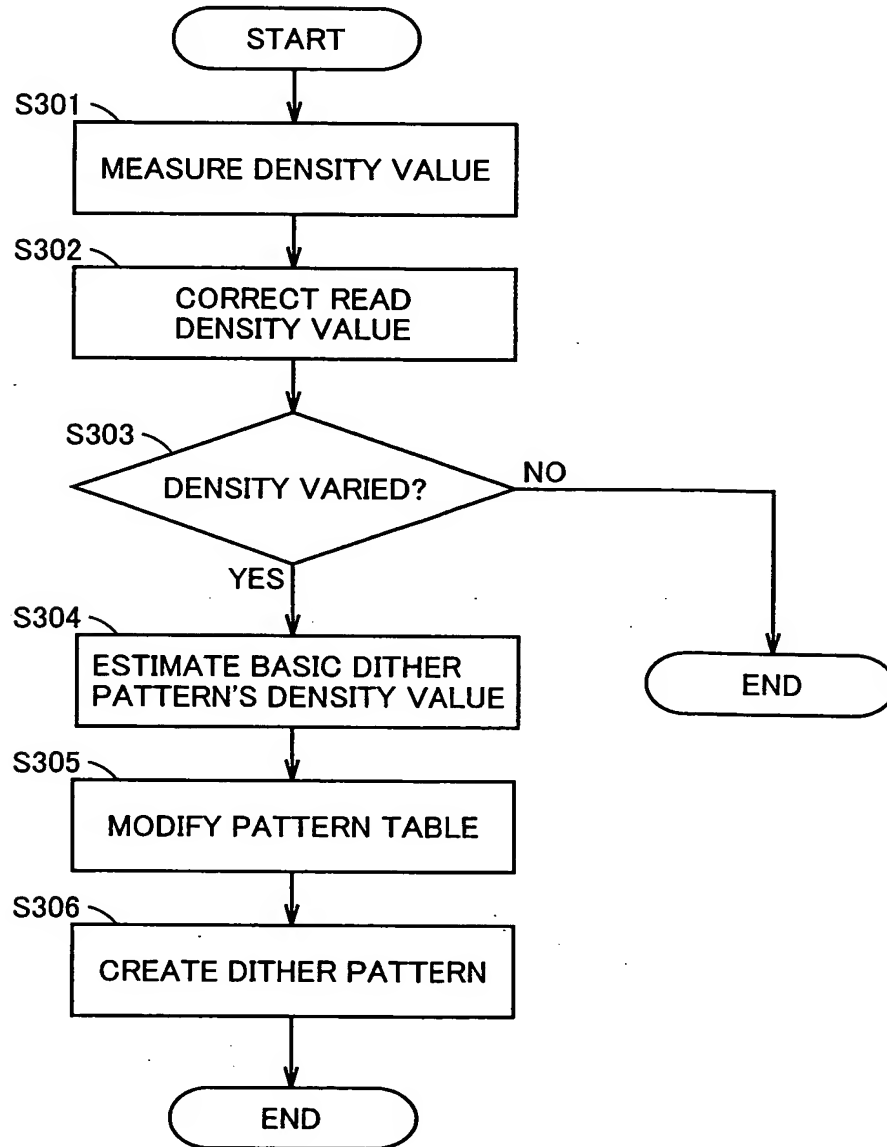


FIG.21

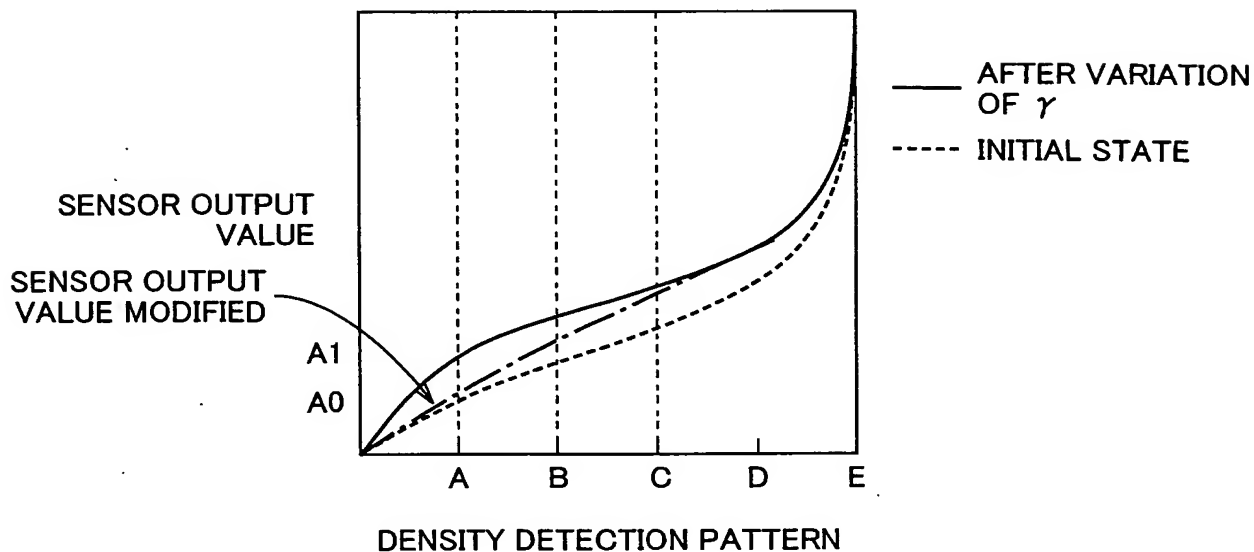


FIG.22

DENSITY DETECTION PATTERN.	INITIAL SENSOR OUTPUT VALUE	SENSOR OUTPUT VALUE AFTER VARIATION OF γ	MODIFIED VALUE
A	A0	A1	$(A1-A0) \times 0.2$
B	B0	B1	$(B1-B0) \times 0.5$
C	C0	C1	$(C1-C0) \times 0.8$

METHOD OF MODIFICATION 2

FIG.23

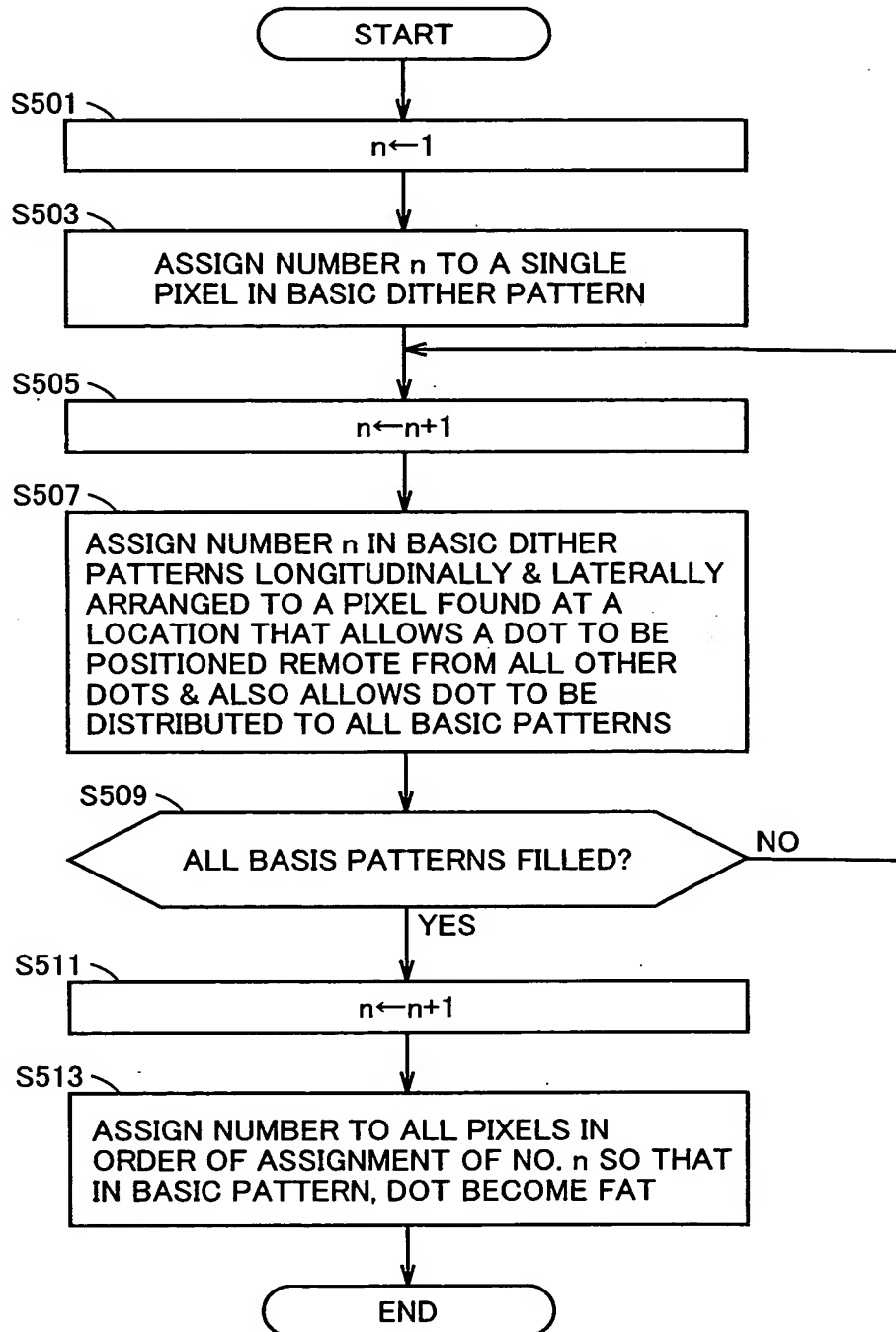


FIG.24

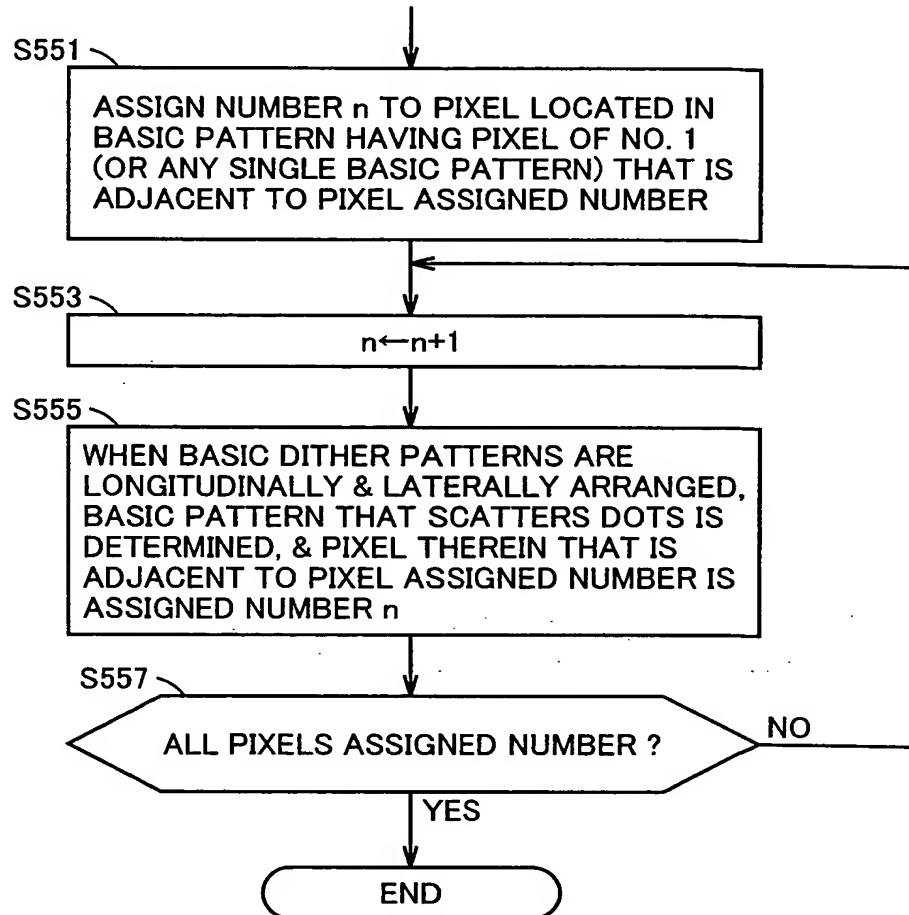


FIG.25

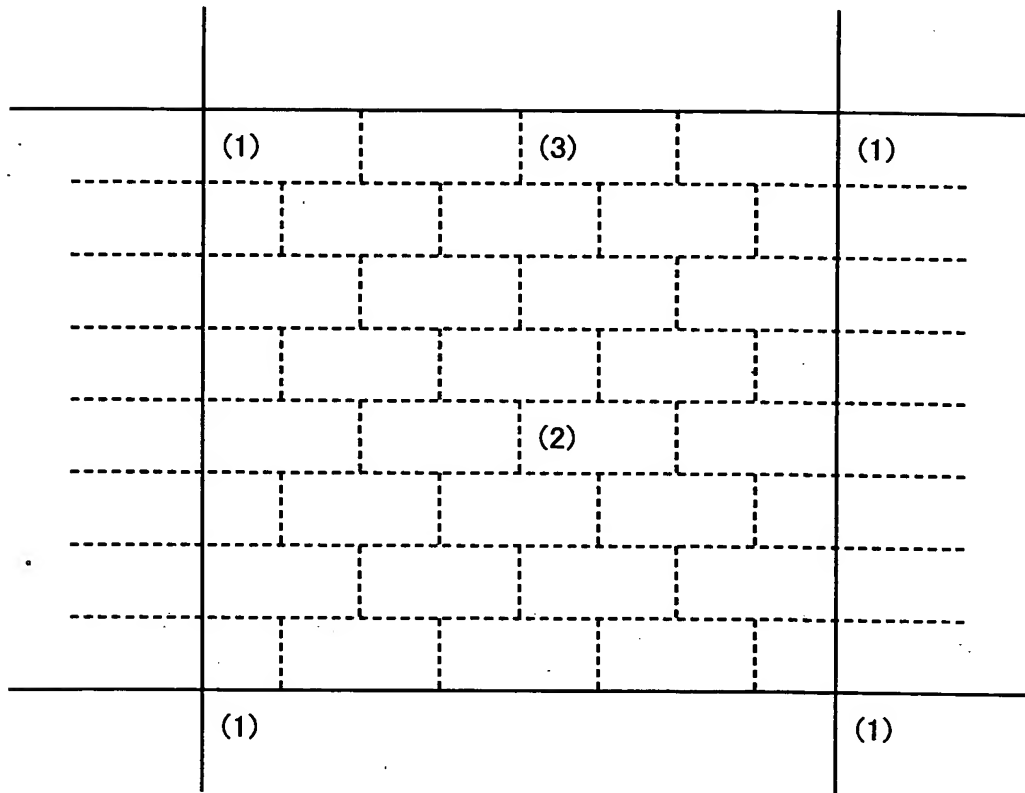


FIG.26

































































































333 225 97 257 385 577 705 881 1057 829 673 545 	385 237 109 258 397 589 717 873 1069 841 685 557 	353 227 89 259 387 579 707 863 1059 831 675 547 	367 239 111 271 399 591 719 875 1071 843 687 559 
321 65 129 288 609 833 893 1121 1088 801 641 	333 77 141 301 621 845 1005 1133 1101 813 653 	323 87 131 291 611 835 895 1123 1091 803 643 	335 79 143 303 623 847 1007 1135 1103 815 655 
449 193 33 161 417 481 737 885 1025 897 789 513 	481 205 45 173 429 483 749 877 1037 909 781 525 	451 185 35 163 419 483 739 887 1027 899 771 515 	463 207 47 175 431 495 751 879 1039 911 783 527 
721 887 1083 855 899 671 	369 241 113 273 401 593 721 877 1073 845 689 561 	377 249 121 281 409 601 729 885 1081 853 697 569 	371 243 115 275 403 595 723 879 1075 847 691 563 
859 1019 1147 1115 827 687 	337 81 145 305 625 849 1009 1137 1105 817 657 	345 85 153 313 633 857 1017 1145 1113 825 665 	339 83 147 307 627 851 1011 1139 1107 819 659 
763 891 1051 823 785 538 	485 208 48 177 433 497 753 881 1041 913 785 529 	473 217 57 185 441 505 761 889 1049 921 793 537 	487 211 51 179 435 499 755 883 1043 915 787 531 
381 233 105 265 383 585 713 869 1065 837 681 553 	357 229 101 261 389 581 709 865 1061 833 677 548 	383 235 107 267 385 587 715 871 1067 839 683 555 	359 231 103 263 391 583 711 867 1063 835 679 551 
329 73 137 297 617 841 1001 1129 1097 809 649 	325 69 133 293 613 837 997 1125 1093 805 645 	331 75 139 299 619 843 1003 1131 1099 811 651 	327 71 135 295 615 839 999 1127 1095 807 647 
457 201 41 189 435 489 745 873 1033 905 777 521 	453 197 37 185 431 485 741 869 1029 901 773 517 	459 203 43 171 427 481 747 875 1035 907 779 523 	455 199 39 187 423 487 743 871 1031 903 775 519 
727 983 1079 851 895 567 	381 253 125 285 413 605 733 889 1085 857 701 573 	373 245 117 277 405 597 725 881 1077 849 693 565 	383 255 127 287 415 607 735 891 1087 859 703 575 
855 1015 1143 1111 823 683 	349 83 157 317 637 861 1021 1149 1117 829 689 	341 85 159 319 639 863 1023 1151 1119 831 691 	351 85 159 319 639 863 1023 1151 1119 831 691 
759 887 1047 819 781 535 	477 221 61 189 445 509 765 893 1053 925 787 541 	489 213 63 181 437 501 757 885 1045 917 789 533 	479 223 63 191 447 511 767 895 1055 927 799 543 
358 228 100 260 388 580 708 864 1060 832 678 548 	368 240 112 272 400 592 720 876 1072 848 690 560 	354 226 88 258 386 578 706 862 1058 830 674 546 	368 238 110 270 398 580 718 874 1070 846 688 558 
324 68 132 292 612 836 996 1124 1092 804 644 	328 60 144 304 624 848 1008 1136 1104 816 656 	322 66 130 290 610 834 994 1122 1090 802 642 	334 78 142 302 622 846 1006 1134 1102 814 654 
452 196 38 184 420 484 740 868 1028 900 772 518 	484 208 48 176 432 496 752 880 1040 912 784 528 	450 194 34 182 418 482 738 866 1026 898 770 514 	482 206 48 174 430 484 750 878 1038 910 782 526 
730 888 1082 854 898 570 	372 244 118 276 404 596 724 880 1076 848 692 564 	380 252 124 284 412 604 732 888 1084 856 700 572 	370 242 114 274 402 594 722 878 1074 846 690 562 
858 1018 1148 1114 826 686 	340 84 148 308 628 852 1012 1140 1108 820 680 	348 82 156 316 636 860 1020 1148 1116 828 688 	338 82 146 306 626 850 1010 1138 1106 818 658 
762 890 1050 822 784 538 	488 212 52 190 438 500 756 884 1044 916 788 532 	478 220 60 188 444 508 764 892 1052 924 796 540 	488 210 50 178 434 498 754 882 1042 914 788 530 
384 238 108 268 396 588 716 872 1068 840 684 556 	380 232 104 264 392 584 712 868 1064 836 680 552 	362 234 106 266 394 586 714 870 1066 838 682 554 	358 230 102 262 390 582 710 866 1062 834 678 550 
332 76 140 300 620 844 1004 1132 1100 812 652 	328 72 136 296 616 840 1000 1128 1096 808 648 	330 74 138 298 618 842 1002 1130 1098 810 650 	326 70 134 294 614 838 998 1126 1094 806 646 
480 204 44 172 428 492 748 876 1036 908 780 524 	456 200 40 168 424 488 744 872 1032 904 776 520 	458 202 42 170 426 490 746 874 1034 906 778 522 	454 198 38 186 422 486 742 870 1030 902 774 518 
726 882 1078 850 894 566 	384 258 128 288 416 608 736 892 1088 858 704 576 	376 248 120 280 408 600 728 884 1080 852 696 568 	382 254 126 286 414 606 734 890 1086 856 702 574 
854 1014 1142 1110 822 682 	352 86 150 310 630 854 1014 1152 1120 822 672 	344 88 152 312 632 856 1016 1144 1112 824 684 	350 84 158 318 638 862 1022 1150 1118 830 670 
758 886 1046 818 780 534 	480 224 64 192 448 512 768 896 1056 928 800 544 	472 216 56 184 440 504 760 888 1048 920 782 536 	478 222 62 190 446 510 766 894 1054 926 798 542 

FIG.27

PATTERN OF 100TH LEVEL. AS COMPARED WITH 256-LEVEL PATTERN TABLE
IN THRESHOLD, DOT HAVING NO. SMALLER THAN 247 IS TURNED ON.

353 257 335 577 705 861 1057 829 873 545	365 257 335 577 705 861 1057 829 873 545	355 257 335 577 705 861 1057 829 873 545	367 257 335 577 705 861 1057 829 873 545
321 257 335 577 705 861 1057 829 873 545	333 257 335 577 705 861 1057 829 873 545	323 257 335 577 705 861 1057 829 873 545	335 257 335 577 705 861 1057 829 873 545
449 257 335 577 705 861 1057 829 873 545	461 257 335 577 705 861 1057 829 873 545	451 257 335 577 705 861 1057 829 873 545	463 257 335 577 705 861 1057 829 873 545
721 887 1083 855 609 571	369 257 335 577 705 861 1057 829 873 545	377 249 317 281 408 801 729 885 1081 853 607 569	371 249 317 281 408 801 729 885 1081 853 607 569
859 1018 1147 1115 827 867	337 257 335 577 705 861 1057 829 873 545	345 257 335 577 705 861 1057 829 873 545	339 257 335 577 705 861 1057 829 873 545
783 891 1051 823 785 538	485 257 335 577 705 861 1057 829 873 545	473 257 335 577 705 861 1057 829 873 545	487 257 335 577 705 861 1057 829 873 545
381 257 335 577 705 861 1057 829 873 545	337 257 335 577 705 861 1057 829 873 545	383 257 335 577 705 861 1057 829 873 545	359 257 335 577 705 861 1057 829 873 545
329 257 335 577 705 861 1057 829 873 545	453 257 335 577 705 861 1057 829 873 545	459 257 335 577 705 861 1057 829 873 545	327 257 335 577 705 861 1057 829 873 545
457 257 335 577 705 861 1057 829 873 545	455 257 335 577 705 861 1057 829 873 545	457 257 335 577 705 861 1057 829 873 545	459 257 335 577 705 861 1057 829 873 545
727 883 1078 851 695 567	381 257 335 577 705 861 1057 829 873 545	373 245 317 277 405 587 725 881 1077 849 893 565	383 255 317 287 415 607 735 891 1087 859 703 575
855 1015 1143 1111 823 863	349 257 335 577 705 861 1057 829 873 545	341 255 317 309 629 853 1013 1141 1108 821 681	331 255 317 319 639 863 1023 1151 1118 831 671
759 887 1047 818 791 535	477 257 335 577 705 861 1057 829 873 545	469 257 335 577 705 861 1057 829 873 545	479 257 335 577 705 861 1057 829 873 545
358 257 335 577 705 861 1057 829 873 545	358 257 335 577 705 861 1057 829 873 545	354 257 335 577 705 861 1057 829 873 545	366 257 335 577 705 861 1057 829 873 545
324 257 335 577 705 861 1057 829 873 545	338 257 335 577 705 861 1057 829 873 545	322 257 335 577 705 861 1057 829 873 545	334 257 335 577 705 861 1057 829 873 545
452 257 335 577 705 861 1057 829 873 545	464 257 335 577 705 861 1057 829 873 545	450 257 335 577 705 861 1057 829 873 545	462 257 335 577 705 861 1057 829 873 545
730 886 1082 854 698 570	372 244 316 278 404 596 724 880 1076 848 892 564	380 252 316 294 412 604 732 888 1084 856 700 572	370 242 314 274 402 594 722 878 1074 846 890 562
858 1016 1144 1114 826 866	340 250 316 308 628 852 1012 1140 1108 820 680	348 252 316 318 636 860 1020 1148 1118 828 688	338 250 316 310 630 828 850 1010 1138 1106 818 658
782 890 1050 822 794 538	468 252 316 300 438 500 756 884 1044 816 788 532	476 250 316 304 444 508 784 892 1052 824 796 540	466 250 316 304 434 498 754 882 1042 814 786 530
384 258 318 288 398 588 718 872 1068 840 684 556	380 252 316 284 392 584 712 868 1064 836 680 552	382 254 318 286 394 586 714 870 1066 838 682 554	358 250 316 282 390 582 710 866 1062 834 678 550
332 258 318 290 300 820 844 1004 1122 1100 812 652	328 258 318 298 818 840 1000 1128 1096 808 648	330 258 318 298 818 842 1002 1130 1098 810 650	326 258 318 294 814 838 998 1128 1094 806 646
480 258 318 292 428 482 748 878 1038 808 780 524	456 258 318 292 424 488 744 872 1032 804 776 520	458 258 318 292 428 490 748 874 1034 806 778 522	454 258 318 292 422 486 742 870 1030 802 774 518
728 882 1078 850 694 568	384 258 318 288 418 608 738 892 1088 860 704 578	378 248 318 280 408 600 728 884 1080 852 696 568	382 254 318 286 414 606 734 890 1086 858 702 574
854 1014 1142 1110 822 862	352 258 318 302 320 840 864 1024 1152 1118 832 672	344 258 318 312 832 858 1018 1144 1112 824 664	350 258 318 312 838 862 1022 1150 1118 830 670
758 888 1048 818 790 534	480 258 318 302 448 512 768 896 1056 828 800 544	472 258 318 304 440 504 760 888 1048 820 792 538	478 258 318 302 448 510 768 894 1054 828 798 542